

Detector Collaboration Meeting

Detector Collaboration Straw Man

Ronald Cooper
SNS Detector Team Leader

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- Current state-of-the-art detector technologies significantly limit the performance attainable at modern high-power neutron user facilities, and make some types of science difficult or impossible
- Developing detector technologies with improved performance would have a significant payoff by allowing more optimal utilization of existing and new neutron sources
- Such detector development requires a sustained effort and should be multi-faceted, since different technologies may be appropriate for different performance goals
- The national laboratories and universities have expertise that is not being optimally utilized because of a lack of funding and inter-laboratory coordination.
- To address this issue, a collaboration should be formed that can submit a proposal to the DOE for funding

- Proposal should be driven by the needs of the detector user community, which in turn responds to the needs of the scientific users.
 - Some of these needs will be specific and some more generic. #
 - A scientific case should be made showing the scientific benefits that would accrue from improvements in each of these areas.
- The proposal should provide specific plans for sustained development that could lead to such performance improvements.
- The proposal should also include a mechanism for promoting information exchange among the various detector laboratories and between those laboratories and the detector user community
- Open questions
 - Organizational structure of collaboration
 - Plan for developing and administering proposal

Major development examples for proposal

- Large area PSD for SANS instruments
 - ~1 m x 1 m
 - ~5 mm x 5 mm pixel
 - Low parallax
 - Good background discrimination and low quiet count
 - Wide dynamic range
- Area PSDs for SNS single crystal diffractometer
 - ~50 cm x 50 cm each
 - ~1 mm x 1 mm pixel
 - Low parallax
 - Good background discrimination and low quiet count
 - Wide dynamic range

- Organization for collaboration
 - Name?
 - Executive committee
 - MOU between institutions?
 - Chair/spokesperson (rotate?)?
 - What is the role/charge for this organization?
- Who writes and submits proposal?
 - Need contributions for each area
 - Need someone to pull these together into coherent proposal
 - How many different projects should be proposed? Which ones?
- Other questions to be answered in proposal
 - Where should funding go (lead organization? or distributed?)
 - How will funding be administered (accounting, reporting, etc.)
 - How are decisions about distribution of funds made?
 - Plan for workshops

Straw Man Collaboration Components

- Collaboration needs to be a coordinated effort to ensure the efficient use of funding and the relevance of the research
- It should have a coordinator to help meet these goals
- A core group should be established
- A minimum effort of 2 FTEs per facility is required
- Funding should be supplied for developing and maintaining expertise
 - Gas Detectors
 - Anger Cameras
 - High Resolution Detectors
 - Scintillation Detectors
 - Solid State Detectors
- Potential funding is probably \$2M - \$3M per year

Straw Man Collaboration Continued

- Collaboration should be extended to universities, small businesses, and national laboratories
- Pursue other avenues of funding
 - Assist universities with NSF proposals
- Small business should be assisted in getting funding through the SBIR program
- The collaboration should help make the SBIR program more relevant #
- The collaboration should join with the detector developers throughout the world in an attempt to coordinate efforts
 - Shifting fiber example

2002 Phase I SBIR Titles

Neutron and Electron Beam Instrumentation

- An Inexpensive, Efficient Neutron Monochromator
- High Performance Thermal Neutron Detector
- Neutron and Electron Beam Instrumentation
- High Gain, Fast Scan, Broad Spectrum, Parallel Beam Wavelength Dispersive X-Ray Spectrometer for SEM
- Advanced X-Ray Detectors for Transmission Electron Microscopy
- Using Convergent Beams for Small-Sample, Time-of-Flight Neutron Diffraction
- Four Probe Stage and Holder for Transmission Electron Microscope